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PREREQUISITE CONCEPTS AND SKILLS

- Resolving vectors into components
- Combining vector components



Dancers spin, twist, and swing through the air. Athletes move in constantly changing directions. The details of these complex motions are studied by kinesiologists by tracking the position of sensors fastened to knees, elbows, or other joints. Position-time data gathered from such experiments can be used to produce photo-realistic animations for movies and video games. This data can also be used to study the details of the motion from a physicist's point of view, providing a basis for measurement of changes in speed and direction — accelerations and the forces that cause them.

When you turn while you run, walk, or dance, you are moving in two dimensions. You might change direction suddenly or do it over several steps, following a curved path. In either case, changes in direction are accelerations, and accelerations require an unbalanced force. In this chapter, you will examine the accelerations and forces involved in two types of two-dimensional motion — objects following a curved path after being launched into the air and objects moving in a circle or part of a circle.